ANALIZA MATEMATYCZNA

LISTA ZADAŃ 11

21.12.2020

(1) Oblicz całkę nieoznaczoną $\int f(x)\,dx$ gdzie f jest dana wzorem:

(a) $\dfrac{5x^2-12}{(x^2-6x+13)^2}$, (b) $\arctan(x)$, (c) $\arctan\sqrt{x}$,

(d) $\dfrac{1}{1+\sqrt{x+1}}$, (e) $x^2\log(x+1)$, (f) $\dfrac{x}{(x+1)(2x+1)}$,

(g) $\dfrac{x}{x^2-7x+10}$, (h) $\dfrac{x-2}{x^2-7x+12}$, (i) $\dfrac{x}{2x^2-3x-2}$,

(j) $\dfrac{4x+3}{(x-2)^3}$, (k) $\dfrac{x^3+1}{x^3-x^2}$, (l) $\dfrac{x^4}{x^2+1}$,

(m) $\dfrac{1}{(x^2+9)^3}$, (n) $\dfrac{x^3+x-1}{(x^2+2)^2}$, (o) $\dfrac{\sqrt{x}}{\sqrt{x}-\sqrt[3]{x}}$,

(p) $\dfrac{1}{x\sqrt{x+1}}$, (q) $\dfrac{1}{1+\sqrt[3]{x+1}}$, (r) $\dfrac{e^x-1}{e^x+1}$ $(t=e^x)$,

(s) $\log(1+x^2)$, (t) $\dfrac{x^2}{1+x^3}$, (u) $x\cdot\log(x^2+1)$,

(v) $\dfrac{1}{x^2-x-1}$, (w) $\dfrac{7x^6+3x^2+4x}{x^7+x^3+2x^2+4}$, (x) $\sqrt{x}\cdot\log(x)$,

(y) $\dfrac{e^x}{e^{2x}+1}$, (z) $\dfrac{e^{2x}}{e^{2x}+1}$, (aa) $\dfrac{e^x}{e^{3x}-1}$,

(ab) $\dfrac{1}{(x+1)\sqrt{x}}$, (ac) $\dfrac{\sqrt{x+1}+1}{\sqrt{x+1}-1}$, (ad) $\dfrac{1}{x^6+x^4}$,

(ae) $\dfrac{1}{(x^2+2x+2)(x^2-4)}$, (af) $\dfrac{1}{\sqrt{1+\sqrt[3]{x+2}}}$, (ag) $\dfrac{x^4}{x^{15}-1}$,

(ah) $\dfrac{1}{x^4+1}$, (ai) $x^2\arctan(x)$, (aj) $\dfrac{2x^2+41x-91}{(x-1)(x+3)(x-4)}$.

(2) Wyraź I_n przy pomocy I_{n-1} lub I_{n-2}

(a) $I_n(x)=\displaystyle\int\frac{1}{(x^2+4)^n}\,dx$, (b) $I_n(x)=\displaystyle\int x^n e^x\,dx$,

(c) $I_n(x)=\displaystyle\int\sin^n(x)\,dx$, (d) $I_n(x)=\displaystyle\int x^n\sin(x)\,dx$,

(e) $I_n(x)=\displaystyle\int\log^n(x)\,dx$, (f) $I_n(x)=\displaystyle\int x^n e^{x^2}\,dx$.